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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/973,235	10/10/2001	Hideaki Fukuzawa	208954US2RD CONT	7269

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Oblon Spicak McClelland Maier & Neustadt
Fourth Floor
1755 Jefferson Davis Highway
Arlington, VA 22202

EXAMINER

BERNATZ, KEVIN M

ART UNIT	PAPER NUMBER
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1773

DATE MAILED: 10/19/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/973,235

Applicant(s)

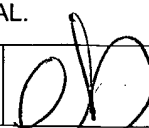
FUKUZAWA ET AL.

Examiner

Kevin M Bernatz

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 29-33 and 37-43 is/are pending in the application.
- 4a) Of the above claim(s) 29,30 and 37-40 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 31-33 and 41-43 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☒ Claim(s) 29-33 and 37-43 are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. ____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>10/10/01</u> . | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Response to Amendment

1. Preliminary amendments to claims 29 - 33, cancellation of claims 1 – 28 and 34 - 36, and addition of claims 37 - 43, filed on October 10, 2001 and March 5, 2002, have been entered in the above-identified application.

Election/Restrictions

2. Applicant's election with traverse of specie group 3 (claims 31 – 33 and 41 – 43) in the reply filed on July 28, 2004 is acknowledged. The traversal is on the ground(s) that there is no undo burden on the Examiner to search all the species. This is not found persuasive since the examiner reminds applicant(s) that a separate classification is a *prima facie* showing of a serious burden (see MPEP § 803). In addition, while the search may be overlapping, there is no reason to believe the search would be coextensive. The requirement is still deemed proper and is therefore made FINAL.

Specification

3. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph within the range of 50 to 150 words (37 CFR 1.72). See MPEP § 608.01(b).

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The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

Double Patenting

4. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

5. Claims 31 and 41 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 6, 8, 24 and 26 of U.S. Patent No. 6,303,218 B1 (Kamiguchi et al.) in view of Gill et al. (U.S. Patent No. 5,701,222).

Regarding claims 31 and 41, Kamiguchi et al. claims a magnetic storage system, comprising a magnetic head (*claim 26*) and a magnetoresistive (MR) effect element (*ibid*), wherein the MR effect element includes a nonmagnetic spacer layer (*claim 24*), first and second ferromagnetic layer separated by the nonmagnetic spacer layer (*claim 24*), the second ferromagnetic layer comprising first and second ferromagnetic films antiferromagnetically coupled to one another and an antiferromagnetically coupling film located between and in contact with the first and second ferromagnetic films for coupling the first and second ferromagnetic films together antiferromagnetically (*claim 8*), the magnetization of the first ferromagnetic layer freely rotating in a magnetic field signal (*claim 24*); and a nonmagnetic high-conductivity layer (*claim 1 – “metal barrier layer” or claim 24 – “conductive layer”*) disposed in contact with the first ferromagnetic layer so that the first ferromagnetic layer is disposed between the nonmagnetic high-conductivity layer and the nonmagnetic spacer layer (*claims 6 and 24*).

The limitations “the first ferromagnetic layer having a magnetization direction at an angle relative to a magnetization direction of the second ferromagnetic layer at zero applied magnetic field” and “so that their magnetizations are aligned antiparallel with one another and remain antiparallel in the presence of an applied magnetic field” are functional limitation(s). As defined in the MPEP, “[a] functional limitation is an attempt to define something by what it does, rather than by what it is (e.g., as evidenced by its specific structure or specific ingredients). There is nothing inherently wrong with defining some part of an invention in functional terms. Functional language does not, in and of itself, render a claim improper. *In re Swinehart*, 439 F.2d 210, 169 USPQ 226 (CCPA

1971)" – MPEP § 2173.05(g). However, the examiner notes that "where the Patent Office has reason to believe that a functional limitation asserted to be critical for establishing novelty in the claimed subject matter may, in fact, be an ***inherent characteristic of the prior art***, it possesses the authority to require the applicant to prove that the subject matter shown to be in the prior art does not possess the characteristics relied on" (emphasis added) - MPEP § 2183.

In the instant case, the claimed functional limitation(s) are deemed to necessarily flow from the structure of the prior art since the prior art is substantially identical in composition and/or structure as applicants' claimed invention. The examiner's sound basis for this assertion is that GMR or TMR type MR elements function by observing the difference in magnetization direction of the free/sense layer versus the pinned/reference layer and the use of synthetic antiparallel pinned layers necessarily requires that the magnetization directions remain antiparallel in the presence of an applied magnetic field or they would cease to function as an effective pinned/reference layer. As such, while Kamiguchi et al. fails to explicitly claim these functional/property limitations, the Examiner deems that the claimed limitations would necessarily be present in the Kamiguchi et al. invention.

Kamiguchi et al. fails to disclose a magnetic recording/reproducing head including a substrate, a lower magnetic shield layer formed on a main surface of the substrate, and a magnetoresistive (MR) effect element formed on the lower magnetic shield layer, and wherein the MR effect head further includes upper and lower magnetic

shields sandwiching the MR effect element through respectively ones of upper and lower magnetic gaps.

However, Gill et al. teach that such a structure is a known structure for forming a shield-type magnetic head including a MR effect element which is capable of achieving large response to an external magnetic field (*Figure 3b and col. 4, lines 30 – 49*).

It would, therefore, have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the device of Kamiguchi et al. to use a shield-type magnetic head meeting applicants' claimed apparatus limitations as taught by Gill et al. in order to form a magnetic head capable of achieving a large response to an external magnetic field.

6. Claims 31 and 41 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 1 of U.S. Patent No. 6,338,899 B1 (Fukuzawa et al.) in view of Gill et al. ('222).

Regarding claims 31 and 41, Fukuzawa et al. claims a MR effect element (*claim 1*), wherein the MR effect element includes a nonmagnetic spacer layer (*ibid*), first and second ferromagnetic layer separated by the nonmagnetic spacer layer (*ibid*), the second ferromagnetic layer comprising first and second ferromagnetic films antiferromagnetically coupled to one another and an antiferromagnetically coupling film located between and in contact with the first and second ferromagnetic films for coupling the first and second ferromagnetic films together antiferromagnetically (*ibid*), the magnetization of the first ferromagnetic layer freely rotating in a magnetic field signal

(*ibid*); and a nonmagnetic high-conductivity layer (*ibid*) disposed in contact with the first ferromagnetic layer so that the first ferromagnetic layer is disposed between the nonmagnetic high-conductivity layer and the nonmagnetic spacer layer (*ibid*).

The limitations “the first ferromagnetic layer having a magnetization direction at an angle relative to a magnetization direction of the second ferromagnetic layer at zero applied magnetic field” and “so that their magnetizations are aligned antiparallel with one another and remain antiparallel in the presence of an applied magnetic field” are disclosed by Fukuzawa et al. in claim 1.

Fukuzawa et al. fails to disclose a magnetic recording/reproducing head including a substrate, a lower magnetic shield layer formed on a main surface of the substrate, and a magnetoresistive (MR) effect element formed on the lower magnetic shield layer, and wherein the MR effect head further includes upper and lower magnetic shields sandwiching the MR effect element through respectively ones of upper and lower magnetic gaps.

However, Gill et al. teach that such a structure is a known structure for forming a shield-type magnetic head including a MR effect element which is capable of achieving large response to an external magnetic field (*Figure 3b and col. 4, lines 30 – 49*).

It would, therefore, have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the device of Fukuzawa et al. to use a shield-type magnetic head meeting applicants' claimed apparatus limitations as taught by Gill et al. in order to form a magnetic head capable of achieving a large response to an external magnetic field.

7. Claims 31 and 41 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 7 and 11 of copending Application No. 09/944,075 in view of Gill et al. ('222). This is a provisional obviousness-type double patenting rejection.

Regarding claims 31 and 41, Fukuzawa et al. claims a MR effect element (*claim 11*), wherein the MR effect element includes a nonmagnetic spacer layer (*ibid*), first and second ferromagnetic layer separated by the nonmagnetic spacer layer (*ibid*), the second ferromagnetic layer comprising first and second ferromagnetic films antiferromagnetically coupled to one another and an antiferromagnetically coupling film located between and in contact with the first and second ferromagnetic films for coupling the first and second ferromagnetic films together antiferromagnetically (*claim 7*), the magnetization of the first ferromagnetic layer freely rotating in a magnetic field signal (*claim 11*); and a nonmagnetic high-conductivity layer (*ibid*) disposed in contact with the first ferromagnetic layer so that the first ferromagnetic layer is disposed between the nonmagnetic high-conductivity layer and the nonmagnetic spacer layer (*ibid*).

The limitations "the first ferromagnetic layer having a magnetization direction at an angle relative to a magnetization direction of the second ferromagnetic layer at zero applied magnetic field" is disclosed by Fukuzawa et al. in claim 1.

The limitation "so that their magnetizations are aligned antiparallel with one another and remain antiparallel in the presence of an applied magnetic field" is deemed

to necessarily flow from the structure of the prior art since the prior art is substantially identical in composition and/or structure as applicants' claimed invention for the reasons cited above.

Fukuzawa et al. fails to disclose a magnetic recording/reproducing head including a substrate, a lower magnetic shield layer formed on a main surface of the substrate, and a magnetoresistive (MR) effect element formed on the lower magnetic shield layer, and wherein the MR effect head further includes upper and lower magnetic shields sandwiching the MR effect element through respectively ones of upper and lower magnetic gaps.

However, Gill et al. teach that such a structure is a known structure for forming a shield-type magnetic head including a MR effect element which is capable of achieving large response to an external magnetic field (*Figure 3b and col. 4, lines 30 – 49*).

It would, therefore, have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the device of Fukuzawa et al. to use a shield-type magnetic head meeting applicants' claimed apparatus limitations as taught by Gill et al. in order to form a magnetic head capable of achieving a large response to an external magnetic field.

Claim Rejections - 35 USC § 112

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Claims 31 – 33 and 41 – 43 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The term "high" in claims 31 and 41 is a relative term which renders the claims indefinite. The term "high" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. This rejection can be overcome by removing the word "high" from the claims or amending the claims to positively recite a range in the conductivity. For purposes of evaluating the prior art, the Examiner has interpreted the claim as simply requiring a nonmagnetic "conductive" layer.

Claim Rejections - 35 USC § 102

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

11. Claims 31, 33, 41 and 43 are rejected under 35 U.S.C. 102(b) as being anticipated by Gill et al. ('222).

Regarding claims 31 and 41, Gill et al. disclose a magnetic storage system, comprising a recording/reproducing magnetic head (*Title and col. 2, lines 54 - 67*) including a "substrate" (*Figure 3b, element 50 or Figure 10, element 147*), a "lower" magnetic shield layer (*element S1 or S2*) formed on a main surface of the substrate and a magnetoresistive (MR) effect element (*elements 61, 31, 33 and 65*) formed on the "lower" magnetic shield layer, wherein the MR effect element includes a nonmagnetic spacer layer (*Figure 3b, element 33*), first and second ferromagnetic layer separated by the nonmagnetic spacer layer (*elements 31 and 65*), the first ferromagnetic layer having a magnetization direction at an angle relative to a magnetization direction of the second ferromagnetic layer at zero applied magnetic field (*col. 4, lines 10 - 13*), the second ferromagnetic layer comprising first and second ferromagnetic films antiferromagnetically coupled to one another and an antiferromagnetically coupling film located between and in contact with the first and second ferromagnetic films for coupling the first and second ferromagnetic films together antiferromagnetically so that their magnetizations are aligned antiparallel with one another and remain antiparallel in the presence of an applied magnetic field (*elements 67, 69 and 71 and col. 6, lines 28 - 46*), the magnetization of the first ferromagnetic layer freely rotating in a magnetic field signal (*col. 1, line 48 bridging col. 2, line 6*); and a nonmagnetic conductive layer (*Figure 3b, layer 61*) disposed in contact with the first ferromagnetic layer so that the first ferromagnetic layer is disposed between the nonmagnetic high-conductivity layer and the nonmagnetic spacer layer (*Figure 3b, relative location of layers 61, 31 and 33*), wherein the MR effect head further includes "upper" and "lower" magnetic shields

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(*elements S1 and S2*) sandwiching the MR effect element through respectively ones of "upper" and "lower" magnetic gaps (*elements G1 and G2 and col. 4, lines 30 – 49*).

Regarding claims 33 and 43, Gill et al. disclose embodiments meeting applicants' claimed relative thickness limitations (*col. 7, lines 6 – 8*). The Examiner notes that the "upper" and "lower" shield and gap layers can be inverted since either capping layer 147 deposited over layer S2 or layer 50 under layer S1 can be considered the "substrate". Since the layers can be inverted, every embodiment necessarily meets applicants' claimed limitations since if the two distances are equal or greater in one direction, but simply inverting what is considered the "substrate" and "upper"/"lower" layers, the two distances will automatically be equal or smaller in relative distance.

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. Claims 32 and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gill et al. as applied above, and further in view of Otsuka et al. (U.S. Patent No. 4,789,910).

Gill et al. is relied upon as described above.

Gill et al. fail to disclose a surface roughness of the upper surface of the "lower" magnetic gap being smaller than the thickness of the antiferromagnetic coupling film (i.e. $\sim 4 - 8 \text{ \AA}$).

However, Otsuka et al. teach that forming head gap films in MR elements which are under the ferromagnetic layers should necessarily possess a surface roughness of 10 \AA or less, since the smaller the surface roughness the better chance of yielding high permeable magnetic films possessing good magnetic properties and reduced gap loss (*col. 4, lines 62 – 65; col. 5, lines 1 – 8; and col. 6, line 51 bridging col. 7, line 6*).

It would therefore have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the device of Gill et al. to use a surface roughness meeting applicants' claimed limitations as taught by Otsuka et al. since the smaller the surface roughness the better chance of yielding high permeable magnetic films possessing good magnetic properties and reduced gap loss.

14. Claims 31, 33, 41 and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kamiguchi et al. ('218 B1) in view of Gill et al. ('222).

Regarding claims 31 and 41, Kamiguchi et al. claims a magnetic storage system, comprising a magnetic head (*claim 26*) and a magnetoresistive (MR) effect element (*ibid*), wherein the MR effect element includes a nonmagnetic spacer layer (*claim 24*), first and second ferromagnetic layer separated by the nonmagnetic spacer layer (*claim 24*), the second ferromagnetic layer comprising first and second ferromagnetic films antiferromagnetically coupled to one another and an antiferromagnetically coupling film

located between and in contact with the first and second ferromagnetic films for coupling the first and second ferromagnetic films together antiferromagnetically (*claim 8*), the magnetization of the first ferromagnetic layer freely rotating in a magnetic field signal (*claim 24*); and a nonmagnetic high-conductivity layer (*claim 1 – “metal barrier layer” or claim 24 – “conductive layer”*) disposed in contact with the first ferromagnetic layer so that the first ferromagnetic layer is disposed between the nonmagnetic high-conductivity layer and the nonmagnetic spacer layer (*claims 6 and 24*).

The limitations “the first ferromagnetic layer having a magnetization direction at an angle relative to a magnetization direction of the second ferromagnetic layer at zero applied magnetic field” and “so that their magnetizations are aligned antiparallel with one another and remain antiparallel in the presence of an applied magnetic field” are deemed to be met for the reasons stated above (*see also Gill et al. - col. 4, lines 10 – 13 and col. 6, lines 26 – 48*).

Kamiguchi et al. fails to disclose a magnetic recording/reproducing head including a substrate, a lower magnetic shield layer formed on a main surface of the substrate, and a magnetoresistive (MR) effect element formed on the lower magnetic shield layer, and wherein the MR effect head further includes upper and lower magnetic shields sandwiching the MR effect element through respectively ones of upper and lower magnetic gaps.

However, Gill et al. teach that such a structure is a known structure for forming a shield-type magnetic head including a MR effect element which is capable of achieving large response to an external magnetic field (*Figure 3b and col. 4, lines 30 – 49*).

It would, therefore, have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the device of Kamiguchi et al. to use a shield-type magnetic head meeting applicants' claimed apparatus limitations as taught by Gill et al. in order to form a magnetic head capable of achieving a large response to an external magnetic field.

15. Claims 32 and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kamiguchi et al. in view of Gill et al. as applied above, and further in view of Otsuka et al. ('910).

Kamiguchi et al. and Gill et al. are relied upon as described above.

Neither Kamiguchi et al. nor Gill et al. disclose a surface roughness of the upper surface of the "lower" magnetic gap being smaller than the thickness of the antiferromagnetic coupling film (i.e. $\sim 4 - 8 \text{ \AA}$).

However, Otsuka et al. teach that forming head gap films in MR elements which are under the ferromagnetic layers should necessarily possess a surface roughness of 10 \AA or less, since the smaller the surface roughness the better chance of yielding high permeable magnetic films possessing good magnetic properties and reduced gap loss (*col. 4, lines 62 – 65; col. 5, lines 1 – 8; and col. 6, line 51 bridging col. 7, line 6*).

It would therefore have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the device of Kamiguchi et al. in view of Gill et al. to use a surface roughness meeting applicants' claimed limitations as taught by Otsuka

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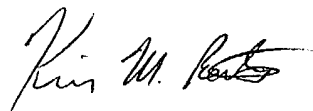
et al. since the smaller the surface roughness the better chance of yielding high permeable magnetic films possessing good magnetic properties and reduced gap loss.

Conclusion

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin M Bernatz whose telephone number is (571) 272-1505. The examiner can normally be reached on M-F, 9:00 AM - 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Deborah Jones can be reached on (571) 272-1535. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Kevin M. Bernatz, PhD.
Primary Examiner

October 14, 2004